

**OPTONICA**

# SERVICE MANUAL

**SHARP-04784**

## MODEL RP-3500H

### SPECIFICATIONS

#### GENERAL

Power source: AC110/220/240V, 50/60 Hz  
Power consumption: 14W  
Semiconductors: 12 transistors, 10 diodes  
Cabinet: Synthetic MIKAGE (Granite) stone board with wooden cabinet.  
Dimensions: 500 mm(W) x 187 mm(H) x 413 mm (D) (with dust cover)  
Weight: 16 kg

#### MOTOR

Motor: 6-pole AC servo motor with 72-pole FG servo mechanism  
Drive system: Direct-drive system  
Speed: 33-1/3 and 45 RPM  
Speed control range: Within  $\pm 4\%$  (Individual control for 33-1/3 and 45 RPM)  
Wow and flutter: Less than 0.04% (WRMS)  
S/N: Better than 60 dB

Turntable Platter: 31 cm aluminum diecast with stroboscope marks

#### TONEARM

Type: Static-balance S-shaped pipe arm  
Effective length: 245 mm  
Overhang: 14 mm  
Off-set angle: 21°  
Cartridge weight range: 4 ~ 18 g

#### CARTRIDGE

Type: VM cartridge  
Frequency response: 20 ~ 20,000 Hz  
Output: 3 mV  
Channel separation: 20 dB  
Optimum tracking force: 2 g  
Load impedance: 47K ohms

4784

**SHARP CORPORATION OSAKA, JAPAN**

## DESIGNATION OF PARTS

(Refer to Figure 1 and 2)

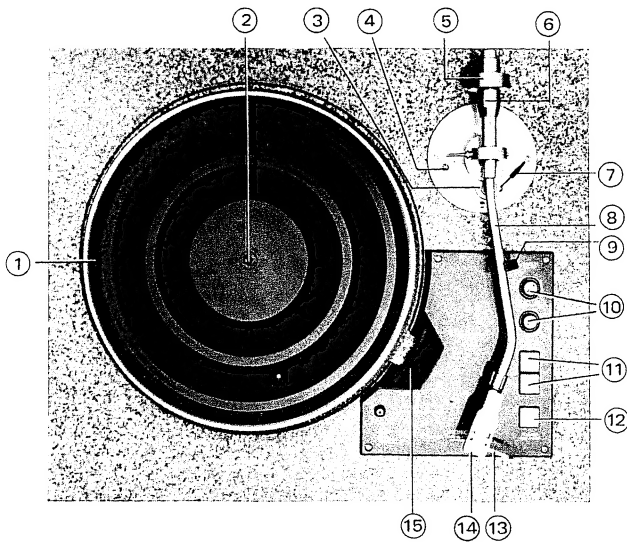


Figure 1

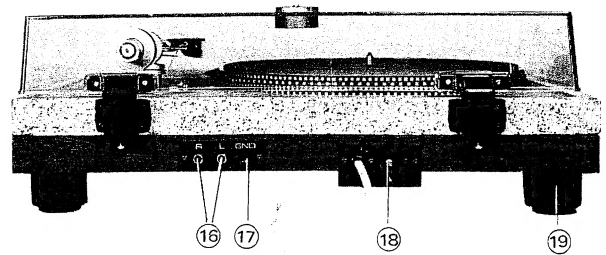


Figure 2

- |   |                                   |
|---|-----------------------------------|
| 1. Turntable                                  | 11. Turntable speed selector      |
| 2. Center spindle                             | 12. Power switch                  |
| 3. Tone arm lifter                            | 13. Finger                        |
| 4. Inside force canceller                     | 14. Head-shell                    |
| 5. Main weight                                | 15. Stroboscope lamp              |
| 6. Sub weight                                 | 16. Output jacks                  |
| 7. Lever of tone arm lifter                   | 17. Earth (ground) terminal       |
| 8. Tone arm                                   | 18. Mains supply voltage selector |
| 9. Tone arm rest                              | 19. Audio insulator               |
| 10. Fine adjustment knobs for turntable speed |                                   |

## VOLTAGE SELECTION

(Refer to Figure 3 and 4)

Check the preset voltage selector before operating the set.  
If the setting is different from that of your local supply mains voltage the selector must be re-set as follows.

- Slack off the screw on the selector plug with a screwdriver until pin under the plug is completely released from the socket.
- Rotate the plug, aligning the arrow to the voltage corresponding with your local mains supply, and re-insert the plug into the socket, tightening up the screw firmly.

Note:

When changing the mains supply voltage, the AC line fuse must be replaced as follows.

MAINS SUPPLY VOLTAGE	FUSE
AC110V	400 mAT
AC220/240V	200 mAT

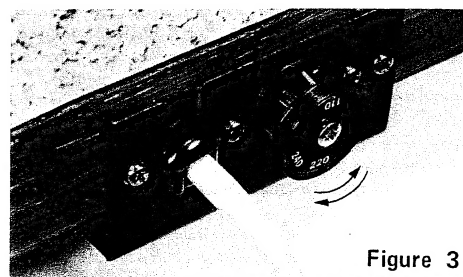


Figure 3

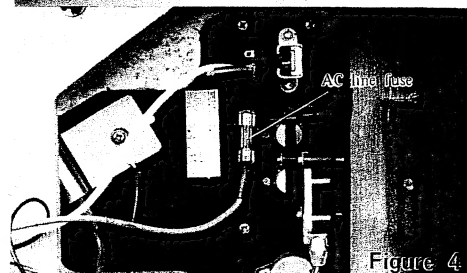


Figure 4

## SETTING PLAYER UNIT

### (1) ASSEMBLING THE PLAYER

This unit is protected when delivered against vibration or impact during transportation: the turntable is separately packed, and the cartridge and weight are also separately packed.

Make preparation in accordance with the following procedures.

1. Insert the dust cover hinge into the player board hinge in the direction of arrow shown in figure 5.
2. Four audio insulators are provided at the bottom of the unit so as to prevent howling (feed back whistle) from taking place. These insulators can be adjusted in height. Therefore, adjust their heights so that the unit is kept horizontal. If the insulators are turned in the direction of arrow shown in figure 6, the height of player board is increased.
3. Gently set the turntable over the center spindle.
4. Place the rubber sheet on the turntable.
5. Mount the main weight on the rear part of tone arm. (Refer to figure 7)
6. Insert the head-shell into the top of tone arm and turn the clamp collar in arrow direction to fix the head-shell. (Refer to figure 8.)
7. Mount the weight on the inside force canceller (anti-skating device). Hook the weight on the groove of bar according to the stylus pressure. (Refer to figure 9)

### (2) STYLUS PRESSURE ADJUSTMENT

1. Depress the power switch to turn off this unit.
2. Remove the stylus cover provided on the cartridge.
3. Pull down the lever of tone arm lifter toward you and detach the tone arm from the tone arm rest.
4. Supporting the tone arm, turn the sub-weight so that "0" graduation on the stylus pressure gauge of sub-weight aligns with the line mark on the tone arm.
5. While sliding the main weight, move it forward and backward until the tone arm is balanced horizontally.
6. Turn the sub-weight in the direction of arrow shown in figure 10, and align the value of proper stylus pressure for the phono-cartridge with line mark.

One turn of sub-weight corresponds to 1 gram and one graduation on the stylus pressure gauge represents 0.2 gram.

#### NOTE:

The proper stylus pressure of phono-cartridge furnished is 2 grams.

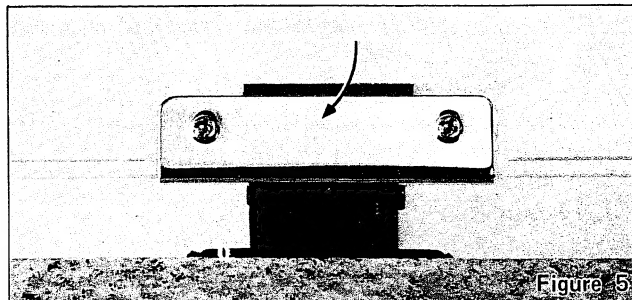


Figure 5

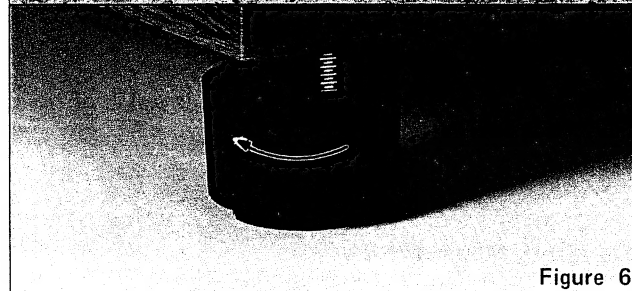


Figure 6

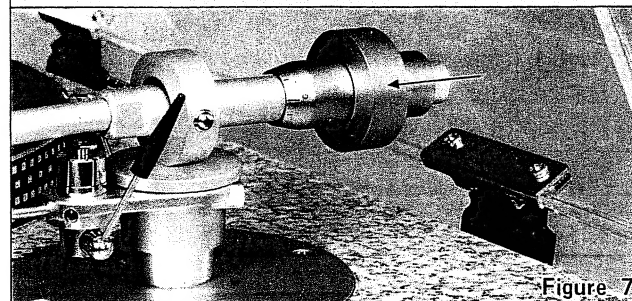


Figure 7

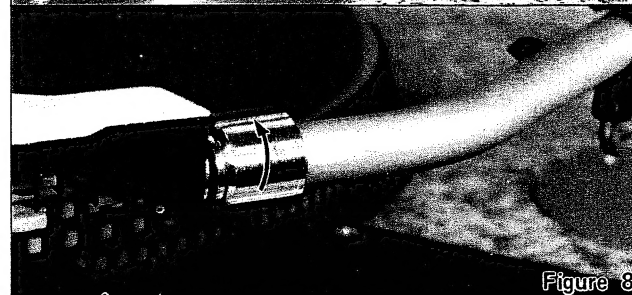


Figure 8

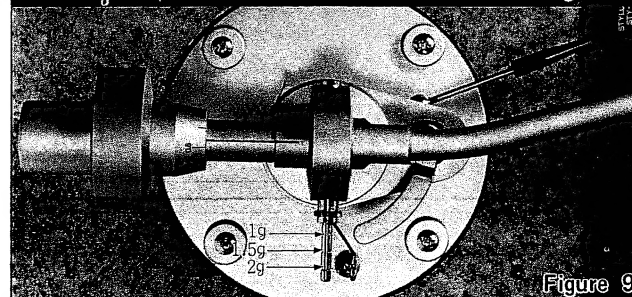


Figure 9

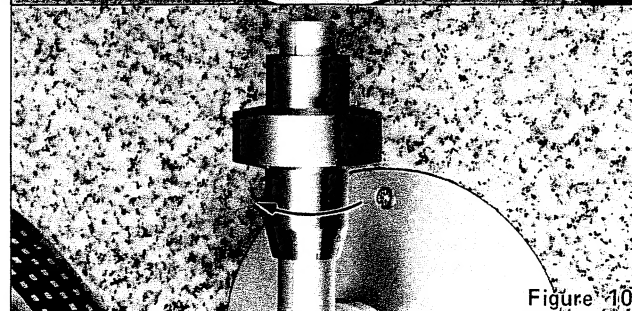


Figure 10

### (3) HOW TO CHANGE STYLUS

The stylus attached to the cartridge has a life of about 500 hours. If the stylus becomes worn out, sound distortion and damage to the record will be caused.

Replace stylus as follows:

1. Purchase a new stylus (Part No. STY-202) at the SHARP's shop in your district.
2. Loosen the clamp collar ring on the tone arm and remove the head-shell.

#### NOTE:

At this time, be sure to cut off the power source of your amplifier being connected with this unit.

3. Pull the stylus out in the arrow direction, holding the stylus holder by finger (Refer to figure 11)
4. Insert the new stylus in the opposite direction of the arrow.
5. Connect the head-shell into the clamp collar ring and turn the ring to secure the head-shell.

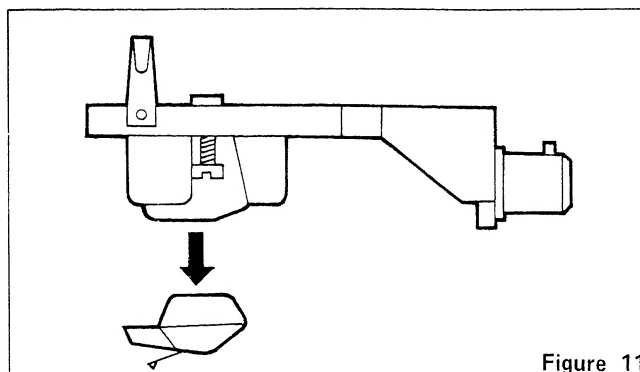


Figure 11

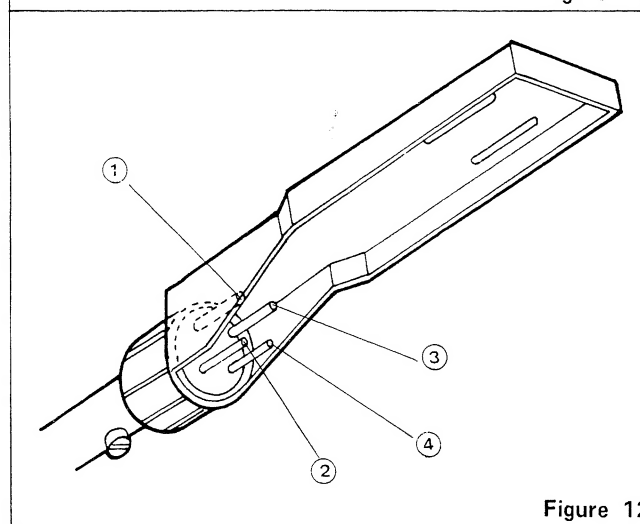


Figure 12

### (4) WHEN USING OTHER CARTRIDGES

1. The cartridge used is MM(moving magnet), MC(moving coil), IM(induced magnet) type cartridge with the output voltage of 2 ~ 7 mV (50 mm/sec.)
2. Connect the wires between the head-shell and cartridge.  
(Refer to figure 12)
  - ① Left hot tip (White)
  - ② Left earth (Blue)
  - ③ Right hot tip (Red)
  - ④ Right earth (Green)
3. Make the distance 50 mm from the stylus end to the rubber packing on the head-shell. (Refer to figure 13)

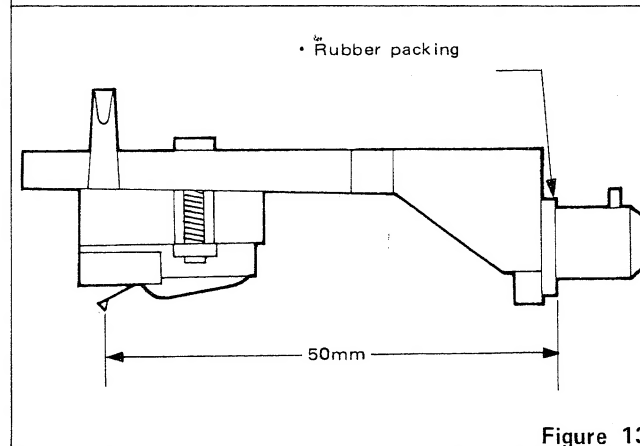


Figure 13

## TURNTABLE SPEED ADJUSTMENT

The revolutionary speed of turntable minutely varies according to the hour during a day, therefore, take the following procedures to obtain an exact speed.

- (1) Turn the speed fine adjusting knob clockwise or counter-clockwise to adjust so that the stripe pattern of a stroboscope provided at the turntable looks like stationary. When the stripe pattern is moving in the turning direction of turntable, this shows that the rotational speed of turntable is faster than as specified. In this case, adjust it by turning the speed fine adjusting knob toward "S".  
Or, when the stripe pattern is moving against the turning direction of turntable, this shows that the turntable rotates slower than as specified, in this case, adjust it by turning the speed fine adjusting knob toward "F".
- (2) Even after the completion of the above adjustment it may be found that the stripe pattern of the stroboscope somewhat moves. This is, however, resulted from the fluctuation in frequency of the supplied power, which does not mean abnormal rotation of the turntable at all. Therefore, no further adjustment is required.
- (3) When the servo-control P.W. board or other electrical parts are replaced for repairing, adjust the turntable speed in the following manner.
  1. Set the speed fine adjusting knobs (VR3, VR4) to the central position.
  2. Adjust the variable resistors (VR1, VR2) so that the stripe pattern of a stroboscope provided at the turntable looks like stationary.

VR1..... For 33-1/3 RPM Adjust  
VR2..... For 45 RPM Adjust

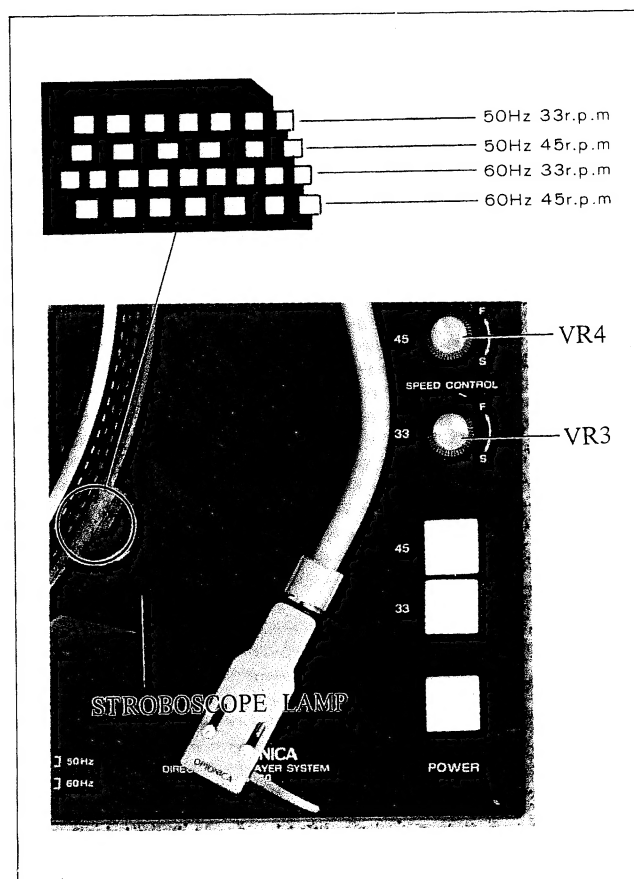


Figure 14

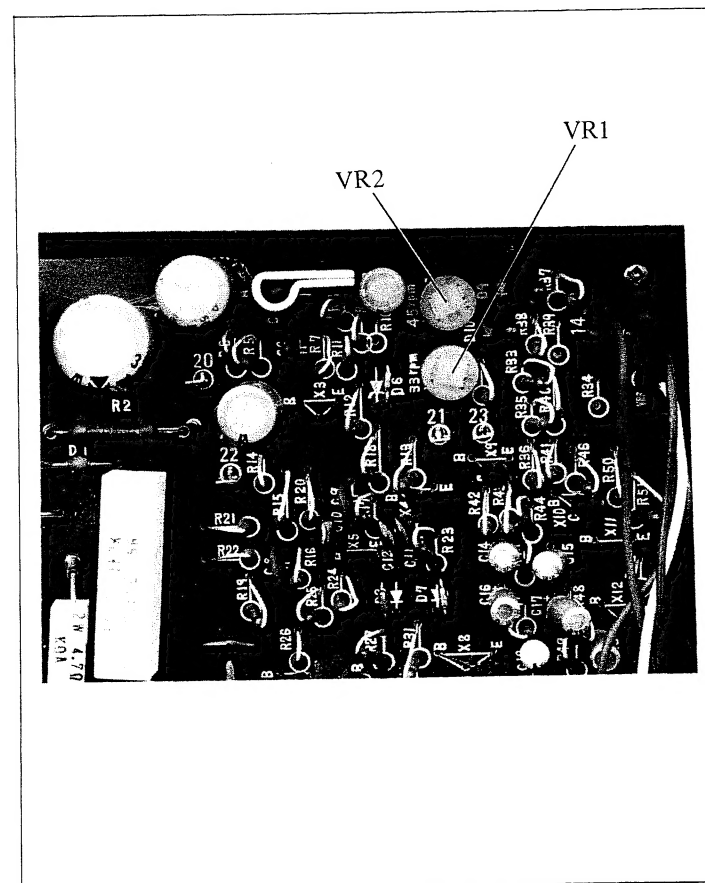
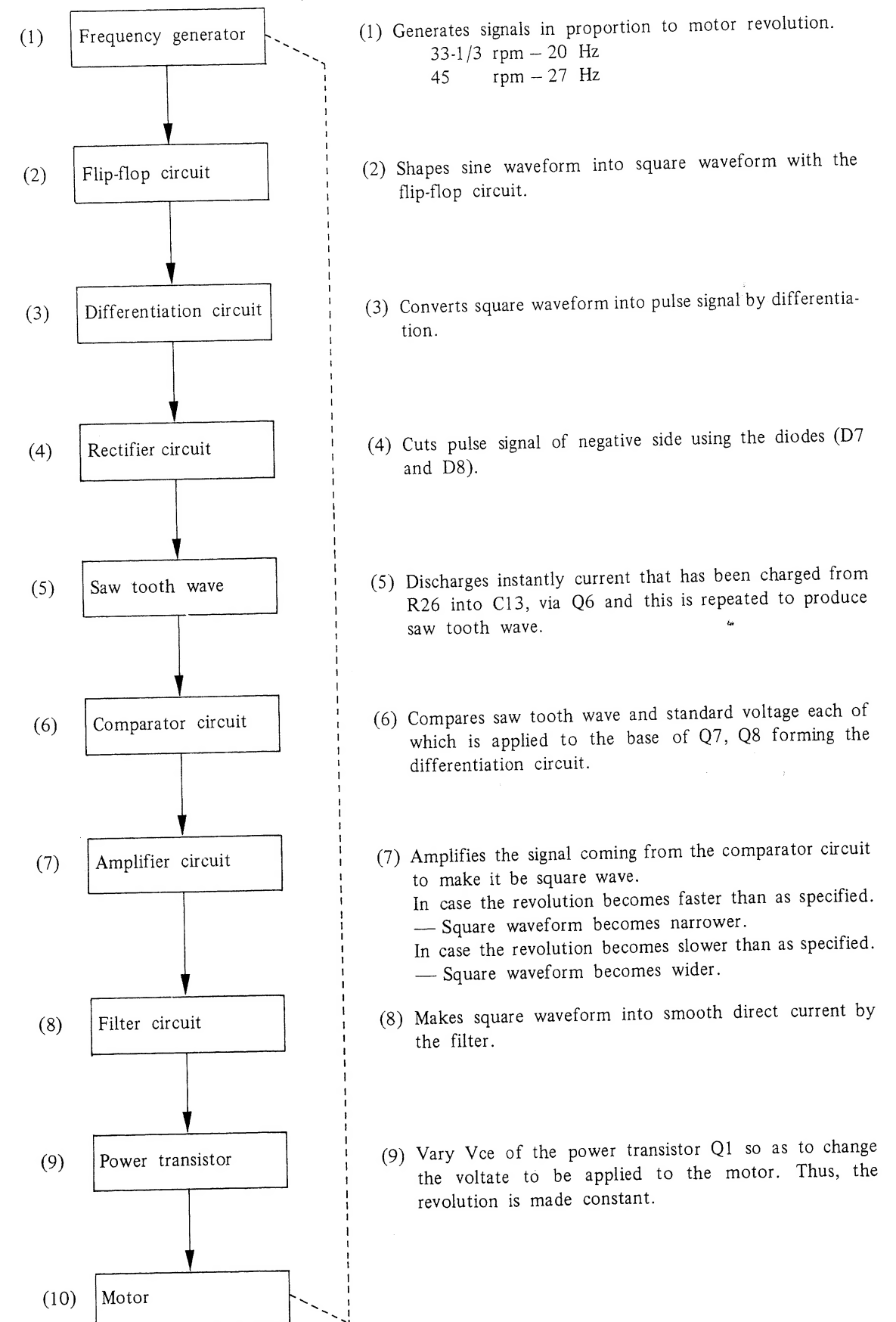


Figure 15

## CIRCUIT DESCRIPTION



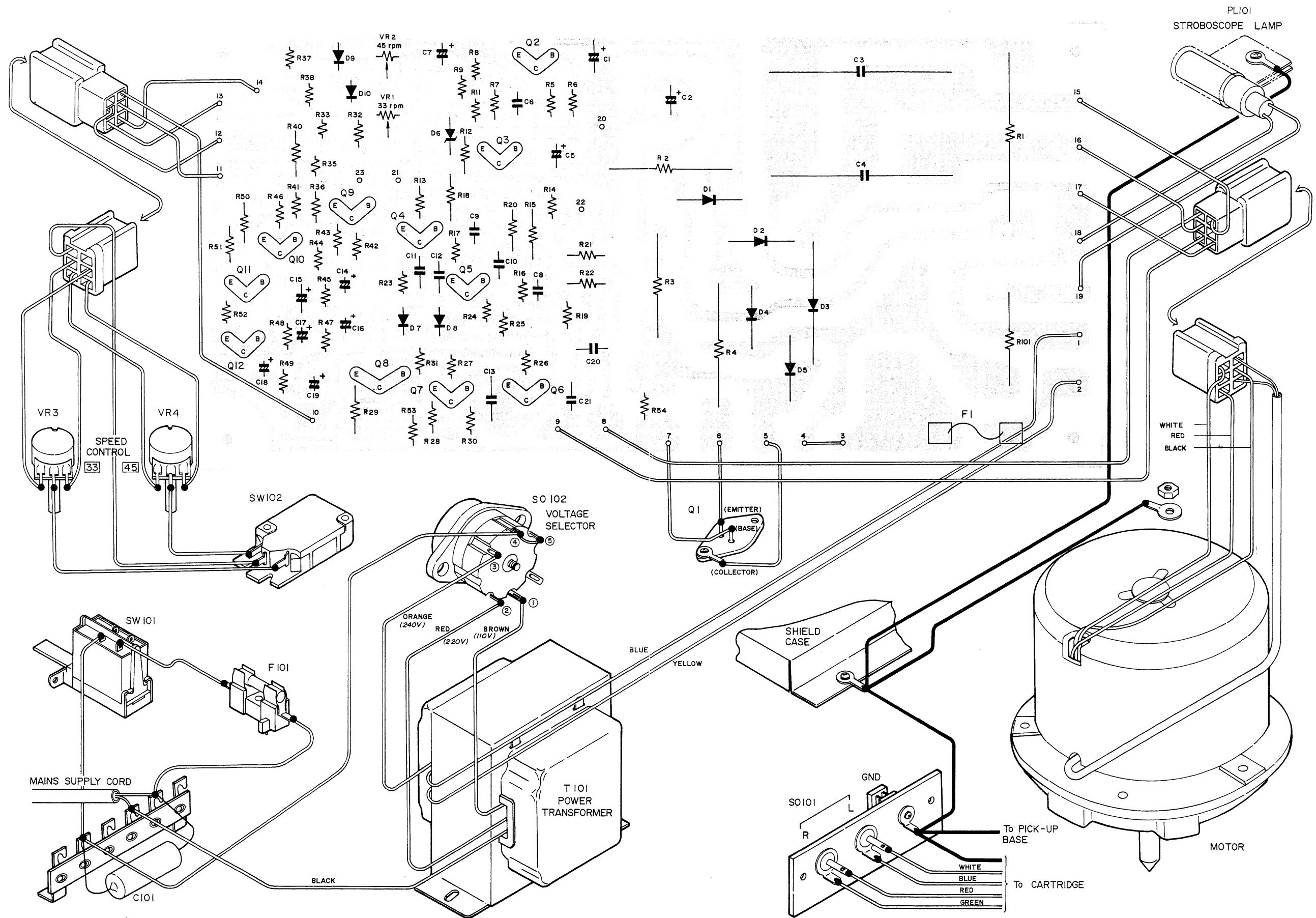
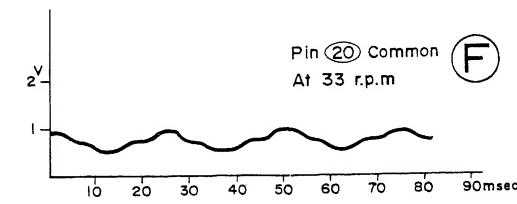
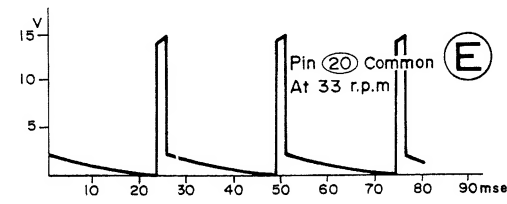
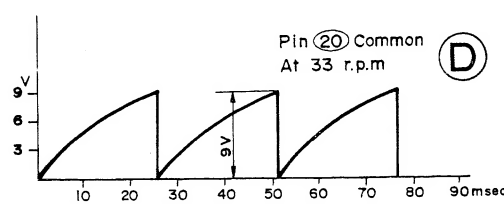
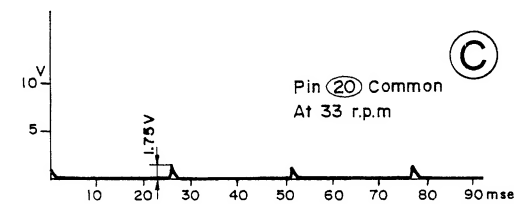
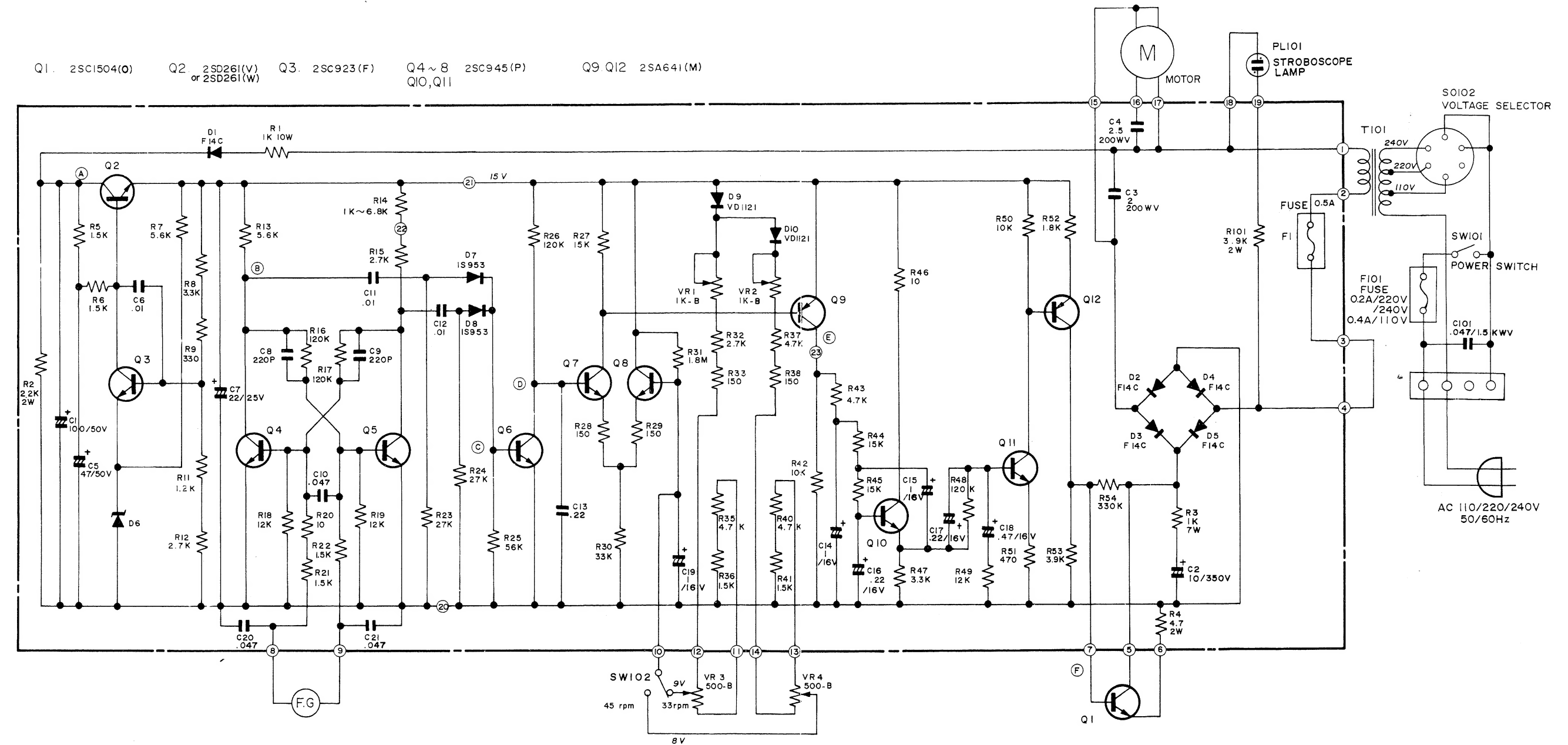
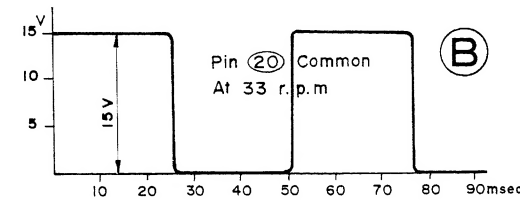
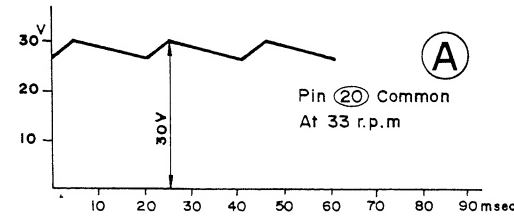


Figure 16 WIRING SIDE OF P.W. BOARD



Specifications or wiring diagrams of this model are subject to change for the improvement without prior notice.

Figure 17 SCHEMATIC DIAGRAM



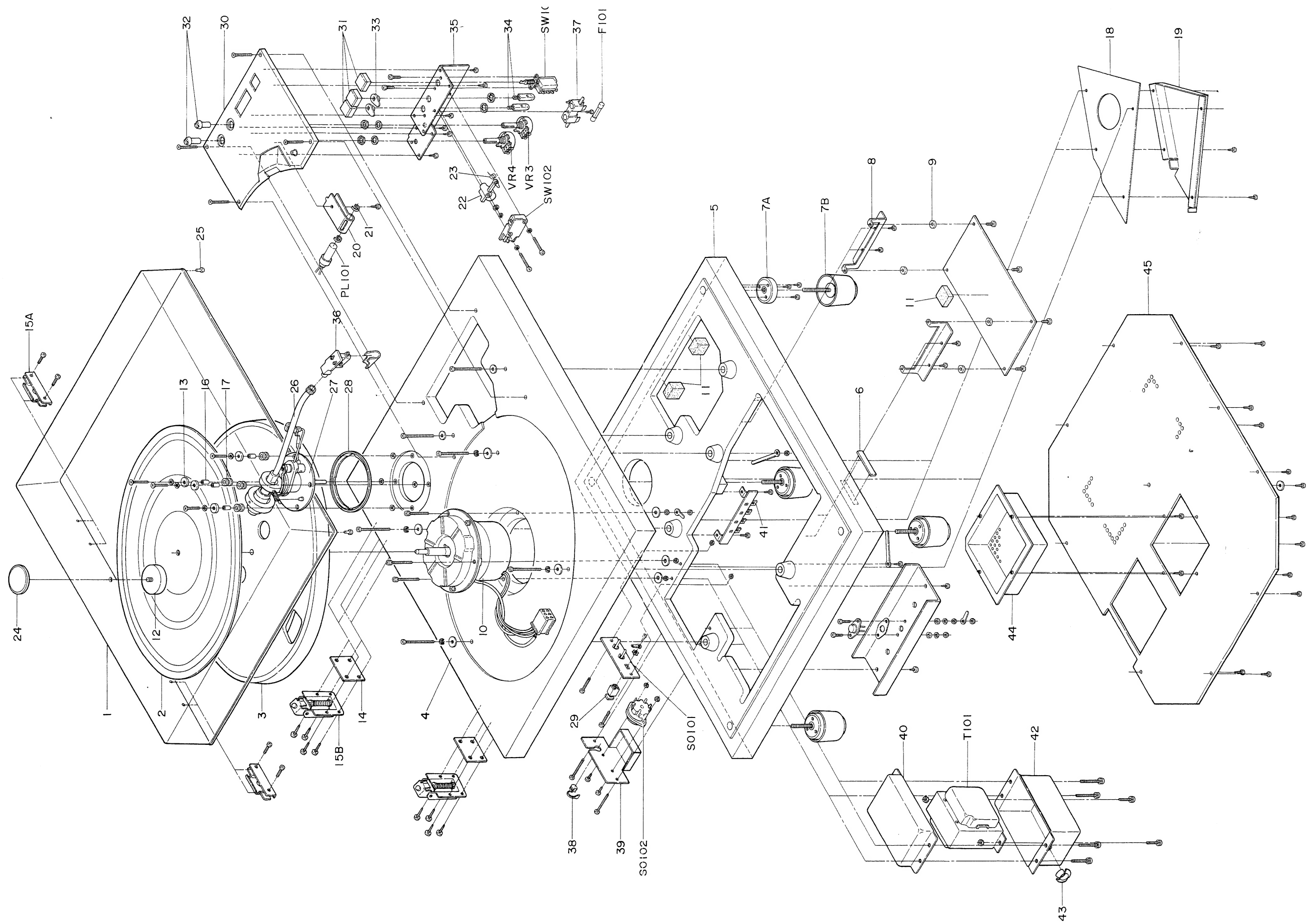


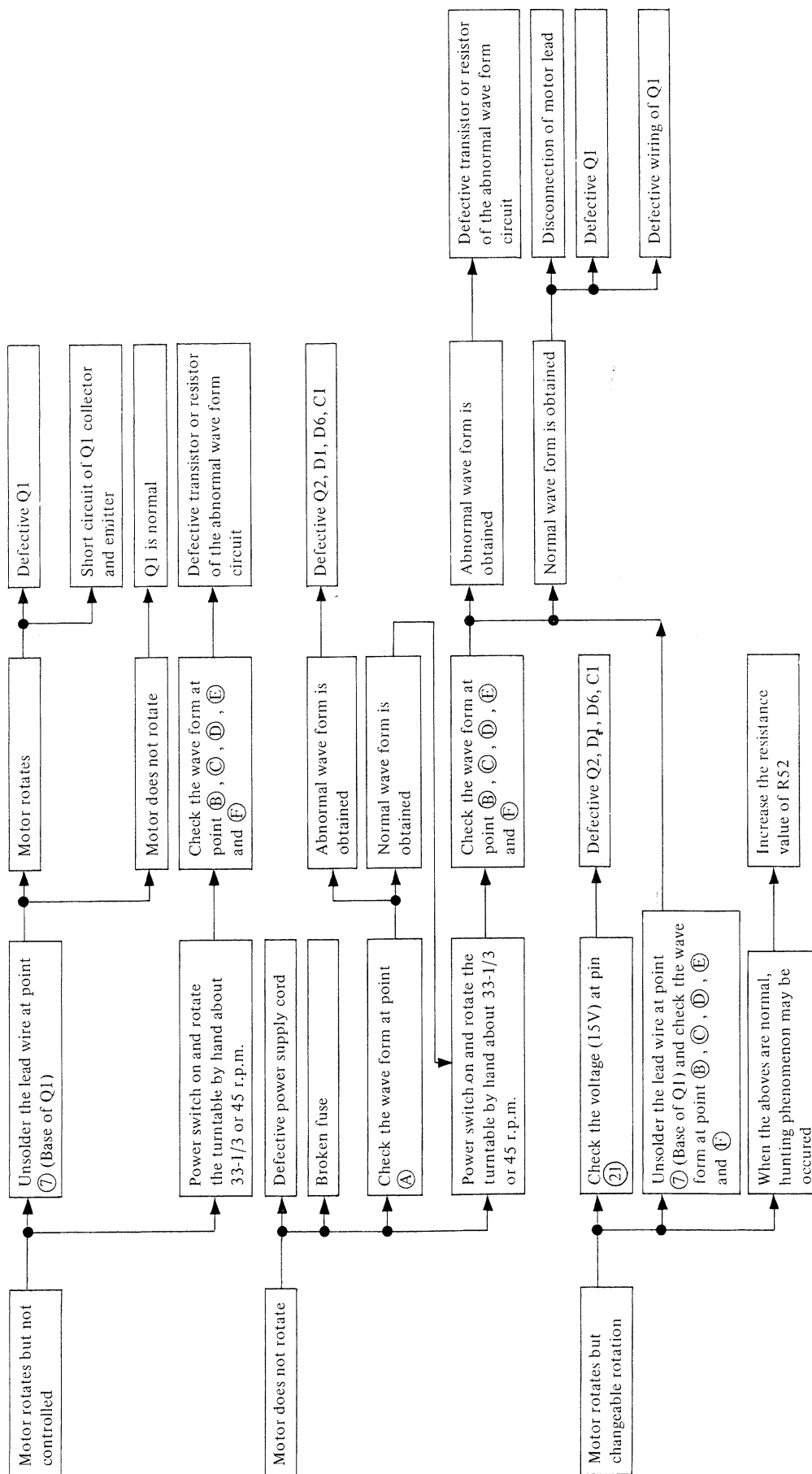
Figure 18 EXPLODED VIEW



## TROUBLE SHOOTING CHART (1)

Phenomenon	Cause	Countermeasure
The stylus tip of cartridge does not go down on disc.	The tone arm lifter lever is located at the "UP" side.	Completely lay down the tone arm lifter lever toward the "DOWN" side.
Playing can be performed but reproduced sounds are distorted.	Adjustment of stylus pressure is imperfect. Inside force canceller is not provided.	Adjust stylus pressure to appropriate value. Mount inside force canceller weight on the specified position.
A sharp, snapping sound is heard during playing	Dust sticks on disc. Small scratches are found on the entire disc. The stylus tip of cartridge is worn out. Dust sticks on the stylus tip.	Remove the dust. Slightly reduce treble by use of amplifier tone control. Replace the stylus by new one. Remove the dust by use of soft brush.
Howling noise is heard when sound volume is increased during playing.	The player is not installed on a stable place. Setting positions of the speaker and player is improper.	Install the player on a stable place. This phenomenon is caused by that sound pressure of speaker is directly applied to the player. Therefore, install the speaker and player on appropriate places to prevent the sound pressure of the speaker from being directly applied to the player.
A humming noise is heard during playing.  Either of speakers produces no sounds.	Connection between player GND terminal and amplifier GND terminal is imperfect. Polarity of power plug is bad. Connection between player output jack and amplifier input jack is imperfect. Wiring between cartridge and head shell is imperfect.	Connect player GND terminal and amplifier GND terminal perfectly. Insert the power plug in less-noise polarity. Fully insert pin plug of connection lead between the player and amplifier. Perform wiring between cartridge and head shell perfectly.
Both speakers produces no sounds.	Connection to amplifier is mistaken. Tightening of head shell is imperfect.	Connect player output cord with PHONO input terminal of amplifier. Perfectly tighten head shell.
Stylus skips while playing a disc.	The player is not installed on a stable place. Adjustment of stylus pressure is not appropriate. No inside force canceller is provided. Disc is deform so heavily. Scratch is found on disc.	Install the player on a stable place. Adjust the stylus pressure to appropriate value. Mount inside force canceller. Replace the disc with new one. Omit to play a scratched part or replace the disc by new one.
Location of reproduced sounds is not clearly felt.	Either channel on hot tip and earth tip is reversed due to replacement of cartridge.	Perform wiring between cartridge and head shell exactly.

## TROUBLE SHOOTING CHART (2)



# REPLACEMENT PARTS LIST

## "HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following informations.

1. MODEL NUMBER
2. REF. NO.
3. PART NO.
4. DESCRIPTION

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
<b>TRANSISTORS</b>				C101	890836-2	.047 MFD, 1500 WV, Oil	
Q1	2SC1504(O)	Motor Drive		<b>RESISTORS</b>			
Q2	2SD261(V) or (W)	Voltage Regulator		R1	_____	1K ohm, 10W, $\pm 10\%$ , Cement	
Q3	2SC923(F)	Voltage Regulator		R2	_____	2.2K ohm, 2W, $\pm 5\%$ , Oxide Film	
Q4, } Q5 }	2SC945(P)	Flip-flop		R3	_____	1K ohm, 7W, $\pm 10\%$ , Cement	
Q6	2SC945(P)	Saw-tooth Wave Form		R4	_____	4.7 ohm, 2W, $\pm 10\%$ , Cement	
Q7, } Q8 }	2SC945(P)	Differential Amp.		R101	_____	3.9K ohm, 2W, $\pm 5\%$ , Oxide Film	
Q9	2SA641(M)	D.C. Amp.		<b>PICTORIAL PARTS</b>			
Q10, } Q11 }	2SC945(P)	Filter (Low Pass)		1	850632-1	Dust Cover	
Q12	2SA641(M)	D.C. Amp.		2	850633	Turntable Sheet	
<b>DIODES</b>				3	620012-2	Turntable	
D1	F14C	Rectifier		4	845677-1	Player Board, Synthetic Granite Stone	
D2, } D3, } D4, } D5 }	F14C	Bridge, Motor Drive Control		5	845850	Cabinet, Plywood	
D6	RD6.8E(B)	Zener, 6.4V $\sim$ 7.2V		6	HBDGD3054AFSA	Badge, OPTONICA	
D7, } D8 }	1S953	Rectifier		7	870483	Insulator	
D9, } D10 }	VD1121	Varistor, Temperature Compensator		8	893267	Bracket, P.W. Board	
<b>TRANSFORMER</b>				9	702266	Spacer, P.W. Board	
T101	870581	Power		10	630832(DAM-506)	Motor	
<b>CONTROLS</b>				11	890731-1	Rubber Cushion, 12 $\times$ 12 $\times$ 13	
VR1	_____	1K ohm, B-type, Turntable Speed Adjust, 33-1/3 RPM		12	893531	Weight, Dust Cover	
VR2	_____	1K ohm, B-type, Turntable Speed Adjust, 45 RPM		13	893528	Cap, Pick-up Base Retaining	
VR3	702986	500 ohm, B-type, Turntable Speed Fine Adjust, 33-1/3 RPM		14	893441	Spacer, Hinge	
VR4	702986	500 phm, B-type, Turntable Speed Fine Adjust, 45 RPM		15(A, B)	893825	Hinge, Dust Cover	
<b>CAPACITORS</b>				16	E-234971	Sleeve, Pick-up Base Retaining	
C2	_____	10 MFD, 350V, Electrolytic		17	893527	Rubber, Pick-up Base Cushion	
C3	_____	2 MFD, 200 WVAC, $\pm 5\%$ , Metallized		18	893438	Shield	
C4	_____	2.5 MFD, 200 WVAC, $\pm 5\%$ , Metallized		19	870505	Case, Shield	
				20	893254	Holder, Stroboscope Lamp	
				21	892096	Rubber, Stroboscope Lamp	
				22	893262	Arm, Turntable Speed Selector	
				23	893265	Spring, Turntable Speed Selector Arm	
				24	893530	Weight, Dust Cover	
				25	893273	Cushion, Dust Cover	
				26	850758	Pick-up Arm Ass'y with Cartridge	
				27	893266	Pick-up Arm Base	
				28	893361	Rubber, Pick-up Base Cushion	
				29	891574	Terminal, Earth	
				30	850727	Panel, Control	
				31	JKNBM0221AFSA	Knob, Turntable Speed Selector, Power Switch	
				32	JKNBN0271AFSB	Knob, Turntable Speed Control	
				33	893258	Guide, Turntable Speed Selector Shaft	

# PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	CODE	REF. NO.	PART NO.	DESCRIPTION	CODE
34	893261	Shaft, Turntable Speed Selector Knob		F101	QFS-C401CAGNI	Fuse, AC Line, 400 mA (For AC110V)	
35	893257	Bracket, Controls		F101	QFS-C201CAGNI	Fuse, AC Line, 200 mA (For AC220/240V)	
36	892397	Cartridge Ass'y (CART-202) with Stylus		PL101	870210	Lamp, Stroboscope	
		Stylus (STY-202)		SW101	QSW-B9066AFZZ	Switch, Power	
37	891730	Holder, AC Line Fuse		SW102	870270	Switch, Turntable Speed Selector	
38	891568-3	Bushing, Mains Supply Cord		SO101	892459	Socket, Output (RCA type)	
39	893738	Bracket, Voltage Selector		SO102	QSOCE0303AGZZ	Socket, Mains Supply Voltage Selector	
40	870585	Cover, Power Transformer			QACCC0002TA0F	Cord, Mains Supply, with USA type Plug	
41	891849	Terminal Strip, 4-lug, 2-ground			QACCN0001AGZZ	Cord, Mains Supply, SEMKO	
42	870586	Cover, Power Transformer			QACCV0001AGZZ	Cord, Mains Supply, KEMA	
43	891729	Bushing, Transformer Cover			(QACCS9001SE00	Cord, Mains Supply, ) SEV	
44	893340	Cover, Motor			QPLGA0205AGZZ	Plug, Mains Supply	
45	870608-1	Cover, Bottom			(QACCC0002AG08	Cord, Mains Supply )	
					QPLGA0201AGZZ	Plug, Mains Supply	
					QCNW-0083AGZZ	Connecting Cord (RCA pin type)	
MISCELLANEOUS							
F1	QFS-C501AAGNI	Fuse, 500 mA					